Identifying the true European 'low-cost airports'

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Abstract

This paper discusses the long-term effects of low-cost carrier (LCC) presence at European airports and identifies the airports that have benefited the most from LCC consolidation during the current century.

The research uses 'LCC Market Share', in terms of seats, to measure the relative importance of LCCs within each airport; and introduces 'EU LCA Rank' as a normalised metric of the capacity share of every airport in the European low-cost segment. It evaluates the trends between 2001 and 2018 in a sample of the 300 largest European airports, by total seats in 2018, using OAG supply information (seats by carrier). Results highlight the role that LCCs have played in boosting the growth of airports, both primary and secondary, that were keen to appreciate the development of the low-cost segment earlier. Indeed, despite the fact that LCCs have put many airports on the European map, during the second half of the period of analysis growth has been more significant for major airports.

In that sense, this paper contributes a better understanding of the recent dynamics in European LCCs choice of airports and, in particular, the long-term effects that this disruptive business model have had for airports. Thus adding to previous contributions by [1]–[4].

Keywords

Low cost airport; Low cost carrier; Longitudinal analysis; European airports

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1. Introduction and background

Despite the impressive growth of low-cost traffic over the last decades (see Figure 1), the academic literature is not yet conclusive on the long-term impact of Low-Cost Carriers (LCCs) for airports. Moreover, as airline business models converge, the impact extends to all airports and not only those with a greater focus on LCCs. In fact, LCCs in Europe use such a diverse range of airports that the notion of a 'low cost airport' (i.e. secondary, remote airports with single-story terminals, no executive lounges and sparse commercial areas) is being increasingly challenged as 'legacy' airlines and airports compete in a mature market. This paper discusses the role of LCCs in reshaping the map of LCCs across Europe.

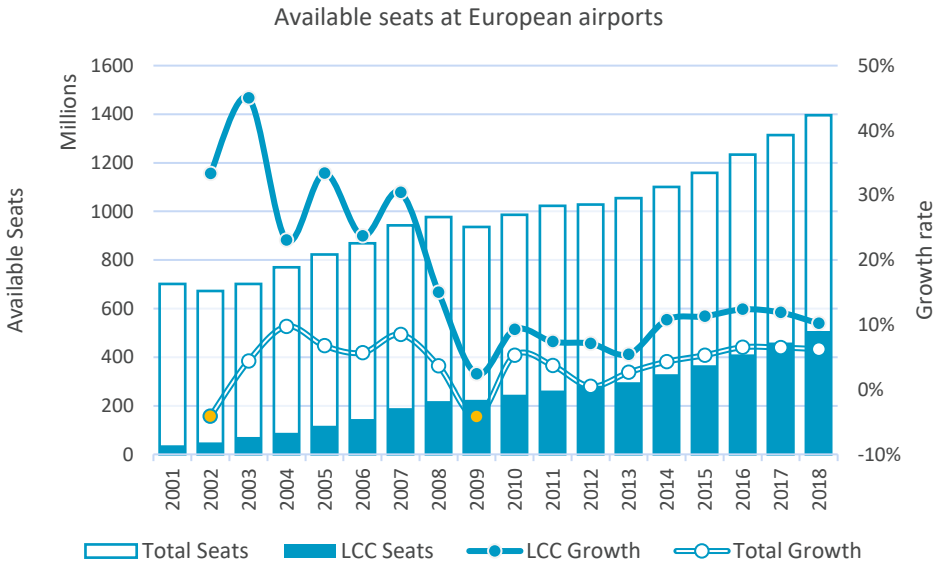

Figure 1. Evolution of LCC and total supply of seats at European airports. Source: [1]

1.1. 'Low-cost airports'

The continuous growth of LCCs during the last decades motivated a number of research studies on the implications of this trend for airports. However, there is no consensual definition of what a 'low cost airport' may be. De Neufville [2] states "that the ascendency of low-cost airlines entails an increased importance and expansion of low cost airports and airport facilities", in such a way that LCCs catalyse the development of low-cost airports. Therefore, LCC expansion triggered the emergence of 'low cost airports' and 'low cost facilities', not vice versa. In that sense, this research considers a 'low cost airport' is one that is used by LCCs to a large extent [3].

Kalakou and Macario [4] analysed the business models for different airport categories and found that 'low cost airports' do not follow a unique model. Yet the authors highlighted that in this category "the majority of the airports does not pay attention to the development of retail activities". They studied Milan Bergamo, Brussels Charleroi, Rome Ciampino, London Luton, Liverpool and London Gatwick as 'low cost airports'. However, airports like Milan Bergamo, Brussels Charleroi and London Gatwick have expanded space for retail stores and food courts in recent years. Overall, the authors concluded that the volume and type of traffic have a

strong influence on the airports business model. It would be interesting to analyse whether the opposite interaction also occurs (i.e. whether the business strategy influences traffic types and volumes).

ELFAA [5] also supported the view that LCCs favoured the development of previously loss-making secondary airports into major international airports serving large metropolitan areas. This encouraged other airports to make the transition and compete to offer low cost, efficient facilities to the growing number of LCCs.

Graham [6] reviewed 60 papers on the relationship between airports and LCCs and concluded that "the academic literature is far less clear and conclusive about the overall impacts of LCC operations at airports and the extent to which airports benefit from LCCs, particularly in the long-term." Moreover, the review argued "that the LCC's choice of airport is very much determined by its operating model, although through time a wide variation of models have evolved which has complicated the situation."

Barret [7] identified seven factors for airports to be attractive for LCCs based on an interview with Ryanair's CEO. At the time of the interview (January 2003) Ryanair carried 15.7 million annual passengers using 56 aircraft and only two bases in continental Europe (Charleroi and Hahn). However, in 2018 Ryanair was already the largest European airline flying over 130 million passengers with 400 aircraft based across 86 airports. Thus the current importance of those original factors is debatable, even for an airline that has until recently largely adhered to its original model [8], [9]. Although, more research has attempted to identify "airport choice factors" for LCCs [10]–[13], literature is less focused on actually measuring how LCCs spread through a variety of airports.

Consequently, it is still commonly agreed that LCCs prefer to use 'secondary' airports [2], [3], [14]–[17]. However, Abda et al. [18] found that, in the USA, LCCs were had bigger market shares at primary airports, "contrary to the common perception that LCCs avoid primary airports and direct competition with the FSCs [Full Service Carriers]" [6]. The recent evolution of the aviation market in Europe hints towards similar developments as the business models of European LCCs evolve. Indeed Dobruszkes [15], [16], [19] has analysed the evolution of LCC networks in Europe but lacks details on the impacts for airports. This is covered on more recent research [20] that recognises the need to have more up to date results to account for the trend of some LCCs moving towards primary airports in Europe as well.

1.2. Evolving nature of LCCs

One of the main outcomes of liberalisation in the European aviation market was the emergence and rapid expansion of LCCs [21]. Yet, there is no single approach to the LCC business model, and the differences affect their decisions on the use of airports or airport infrastructure. Considering their individual history, LCCs can be categorised in three groups. First, the *original* LCCs are airlines deliberately organised around the 'low-cost' theme (such as easyJet, Ryanair, Norwegian or Vueling). Second, there are *descendants of charter airlines* that, confronted with decreasing market shares as the "originals" expanded [22], [23], transformed to LCCs and inherited an operational and network structure (such as the now extinct Monarch, Jet2.com or SmartWings). Third, there are *spin-offs* of the traditional, legacy carriers that were set to compete with the *originals* on a similar cost-base (such as GO, Buzz and Clickair in the past, or Germanwings/Eurowings and Iberia Express).

Nevertheless, there are also differences in the models used by airlines within each group. Yet, in general lines, the *originals* chose to capture market at secondary airports (i.e. easyJet at Luton, then Liverpool; Ryanair at Stansted, then Charleroi, and so on). This is different from *FSC spin-offs* and *charter-descendants*, which correspondingly operate from the same bases as their parents or predecessors. More importantly, the groups represent a dynamic evolution:

originals became large and took market from charters and FSCs, who responded by transforming themselves or by creating spin-offs. In the USA these dynamics led to the convergence of costs, fares and business models [18], [24], [25]. In Europe convergence is occurring as well [26], and not only from the transformation of traditional legacy airlines. LCCs – including the *originals* – are also refining their product to attract segments that are less price sensitive because, as they mature, their unit costs (labour in particular) tend to increase. As Christensen et al. [27] explain, across industries "the path to greater revenue is upmarket migration".

As former new entrants go upmarket, the bottom empties enough to encourage disruptive innovations of new entrepreneurs. In the USA this resulted in the emergence of so-called ultra-LCCs like Allegiant and Spirit (both transformed from charters). Arguably, European companies like Ryanair, Wizz Air and Pegasus already applied the ultra-LCC model; hence, there is less room to stimulate new markets with even lower fares. Therefore, they can only do something similar by moving to major airports that were previously not part of their networks.

Irrespective of how airline business models continue to evolve, and airlines group to consolidate, airports should monitor and be ready to accommodate changes. If the expansion of LCCs provides any lesson to airports, it is that their development should be flexible enough to cope with the uncertain future. In this sense, the rest of this paper discusses how LCCs in Europe have impacted both secondary and main airports.

2. Sample and data selection

In order to assess the long-term effects of LCC presence at European airports and identify the airports that have benefited the most from LCC consolidation, this research evaluates the trends of airline supply between 2001 and 2018. Supply information consists of annual available seats by carrier and departure airport according to OAG database [1]. Data comes from a sample of the 300 largest European airports by total seats in 2018. "Europe" includes all countries defined in OAG regions EU1 (Western Europe) and EU2 (Eastern/Central Europe). This denomination includes all of the Russian Federation, Georgia, Azerbaijan, Armenia, Turkey, Cyprus and the Balkans, and it is consistent with IATA's definition of "Europe".

The classification of Low-Cost Carriers follows OAG Mainline/Low Cost categories. This approach capitalises on OAG's knowledge on the industry and avoids a subjective analysis of over 1000 airlines that appear on the database, for which detailed information on unit costs is not available. Similarly, the main variable of interest for the research, 'available seats', include all regular scheduled departures by all carriers from airports in EU1 and EU2 regions towards all regions in the world. This prevents the under-representation of the major European hubs and extends the analysis beyond the intra-European market.

3. Measuring the impact of LCCs on European airports

Measuring the relative importance of LCCs at European airports is not a straightforward task. The largest European LCCs have wide networks with many more than 100 destinations each. At the same time, some airports may be completely dominated by LCCs but relying exclusively on a single airline or not having a significant size. Other airports became *bases* for LCCs (an airport where the carrier permanently positions aircraft and crew who return by the end of the day's rotations and park overnight) as these airlines established a considerable number of bases outside their registration countries and turned into truly pan-European carriers. Bases offer the carriers operational flexibility, and cost savings for routine aircraft maintenance and repair and crew recruitment [28]. They also contribute to the bargaining power of airlines against airports because they provide routes, passenger traffic and other economic benefits for the hinterland [29]. Therefore, an airport that is able to become an airline base may have more of the characteristics that make it attractive to LCCs.

Yet it may not be essential for airports to be a base. Paris Beauvais, for instance, handles nearly 4 million annual passengers without any based aircraft. Similarly, London Luton is the second largest airport for Wizz Air in terms of seats, but the airline only created a permanent base after Brexit became a real threat. Consequently, we propose more indicators to analyse the relative importance of LCCs at the airports under study.

3.1. Ranking airport participation in the low-cost segment

To analyse the level of consolidation of low-cost services, we measured the capacity deployed by LCCs in comparison with the total capacity available at the airport (i.e. the proportion of total annual seats provided by LCCs, out of the total for all the airlines at every airport). This variable, referred as '*LCC Market Share*', reflects the market share of LCCs in every airport market.

In order to analyse how airports compare with each other, we computed the share of every airport in the low-cost segment in Europe. This, the '*EU LCA Share*', corresponds to the proportion of seats offered by LCCs at each airport in relation to the total number of seats offered by LCCs in all European airports. To compare more easily with the previous variable ('*LCC Market Share*'), and to analyse the evolution of LCC influence along the period of analysis, we also created a rank by normalising '*EU LCA Share*' with respect to the airport with the largest number of seats provided by LCCs every year, i.e. the airport with the largest '*EU LCA Share*'. The resulting variable, refered as '*EU LCA Rank*' (see equation (1) for how to compute the variable for airport *i* in year *t* considering all airlines *k*), ranges from 0 to 1, where 1 corresponds to the airport that contributes the most to the European low-cost market. The variables '*LCC Market Share*' and '*EU LCA Rank*' respectively describe the market penetration of LCCs at an airport and the significance of an airport at European level for low-cost services.

$$EU\ LCA\ Rank_{it} = \frac{\frac{\sum_{k\ \in\ LCC} Seats_{kit}}{\sum_{k}\ Seats_{kt}}}{max_t\left(\frac{\sum_{k\ \in\ LCC} Seats_{kit}}{\sum_{k}\ Seats_{kt}}\right)} \qquad (1)$$

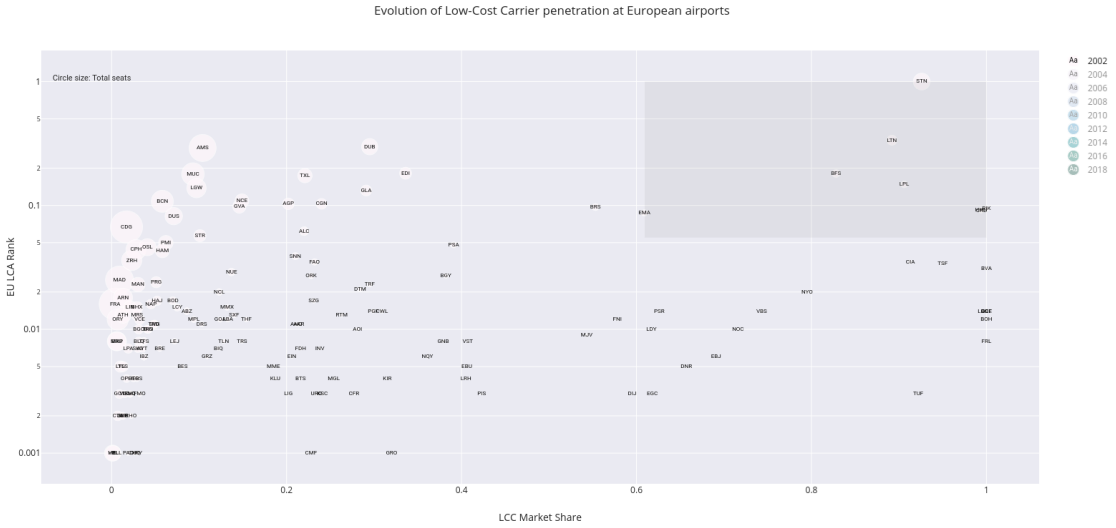

Figure 2. Participation of European airports in the low-cost market, 2002. Source: Authors based on [1]

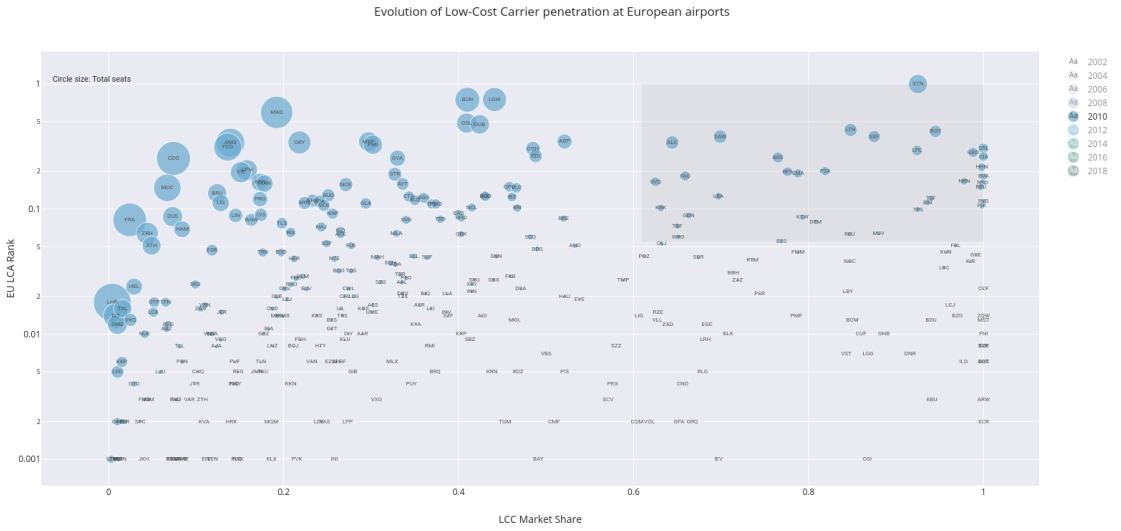

Figure 3. Participation of European airports in the low-cost market, 2010. Source: Authors based on [1]

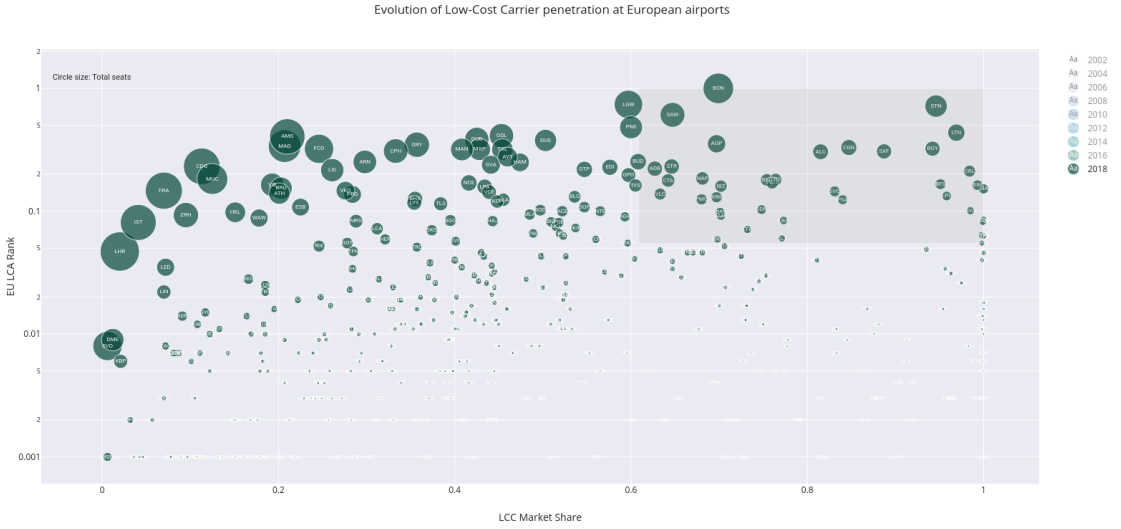

Figure 4. Participation of European airports in the low-cost market, 2018. Source: Authors based on [1]

Figure 2, Figure 3 and Figure 4 show the evolution of European airports according to the two metrics, '*LCC Market Share*' in the horizontal axis and '*EU LCA Rank*' in the vertical axis on a logarithmic scale to facilitate visualisation. The size of the circles in the figures represent the total number of seats provided by all airlines, hence the largest circles correspond to the largest airports in Europe. Two trends are clear from the analysis of these figures. First, LCCs have gained stronger market share in most airports in Europe, as the circles move to the right as time progressed. Second, the bulk of the growth in the low-cost market have remained with main airports and with those that were able to capitalise the initial phase of LCC ascendency, as the larger circles move up as time progressed.

In the end, by 2018 the largest 'low-cost airport' in Europe, i.e. the one providing the largest amount of seats by LCCs, was Barcelona El Prat airport. It provided 21 million seats by LCCs that accounted for 4.1% of the total low-cost market. Along with the main airports that figure prominently on the upper part of Figure 4, some airports traditionally regarded as 'low-cost'

have been able to sustain a significant position in the segment, particularly London Stansted, London Luton and Milan Bergamo; as well as Brussels Charleroi, Rome Ciampino and Paris Beauvais, albeit to a lower extent.

4. Embracing LCC growth

Figure 5, Figure 6, Figure 7 and Figure 8 depict the rise of LCC presence at European airports from a geographical perspective. In 2001, few airports were dominated by LCCs. They were pioneers in the segment and, likely because of this, they set what became a standard for the kind of 'secondary' airport that literature often refers as a "requirement" for LCCs: uncongested, simple layout, normally single-story buildings with few amenities [3]; but overall, willing to support the nascent business model of new entrants and converted charters. These airports enjoyed a sort of golden era up to the global financial crisis (2008 - 2009). Indeed, some of them were able to retain a strong position after that, particularly London Stansted, London Luton, Brussels Charleroi and Rome Ciampino. However, the shift of some carriers (especially Ryanair) to main airports and the growth of other types of LCCs proved challenging for several of these pioneering 'low-cost' airports. Most notably Hamburg Lubeck that went bankrupt in 2014, Glasgow Prestwick, which went back to government ownership in late 2013, and Frankfurt Hahn.

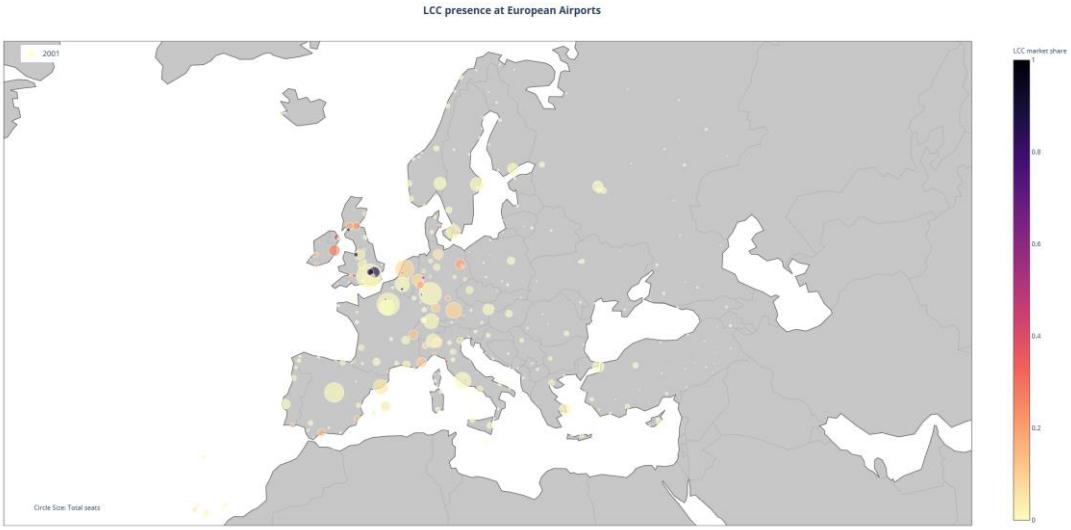

Figure 5. Evolution of LCC market at European airports, 2001. Source: Authors based on [1]

By 2018, several 'main' airports joined Barcelona as leaders in the low-cost market, such as London Gatwick, Dusseldorf, Stuttgart and Palma de Mallorca; along with Bucharest Otopeni and Sofia in Eastern Europe. Remarkably, and despite the role that LCC traffic has had in growing most French airports, only three airports in France are dominated by LCCs (LCC Market Share above 50%): Nantes, Paris Beauvais and Lille. Surprisingly, even though there is a marked dominance of LCCs in the Mediterranean and the Canary Islands, airports in Greece are not markedly dominated by LCCs. Secondary airports remain representative for low-cost traffic for Scandinavia.

On the other hand, airports in Iceland, Finland, Russia, Estonia, Latvia, Belarus, the Czech Republic, most of the Balkans (except Croatia and Macedonia) and Malta show a lesser penetration of LCCs (see Figure 8). That is not to say that LCCs have not grown in these locations, rather incumbent legacy carriers still hold a significant position, or the market is too small in relation to the whole of Europe.

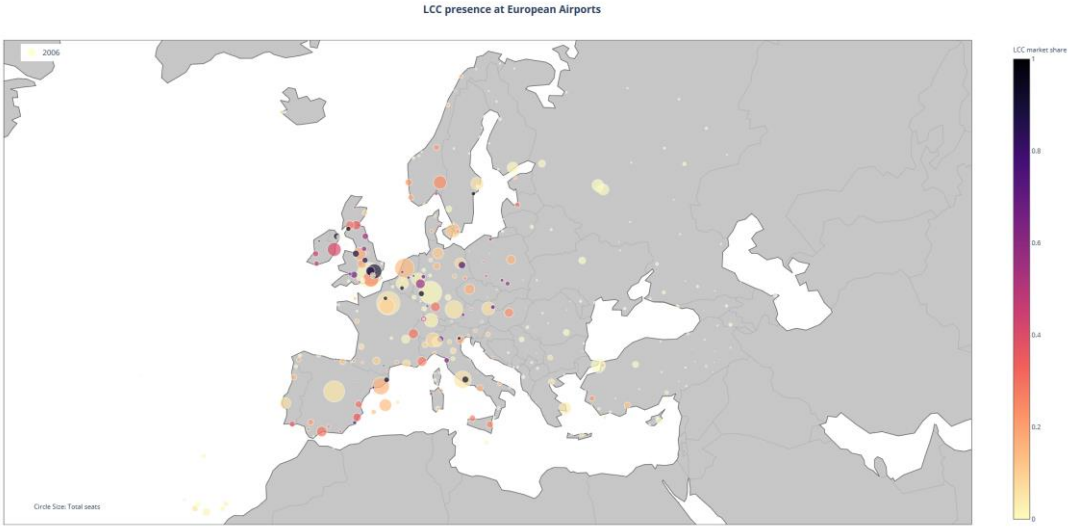

Figure 6. Evolution of LCC market at European airports, 2006. Source: Authors based on [1]

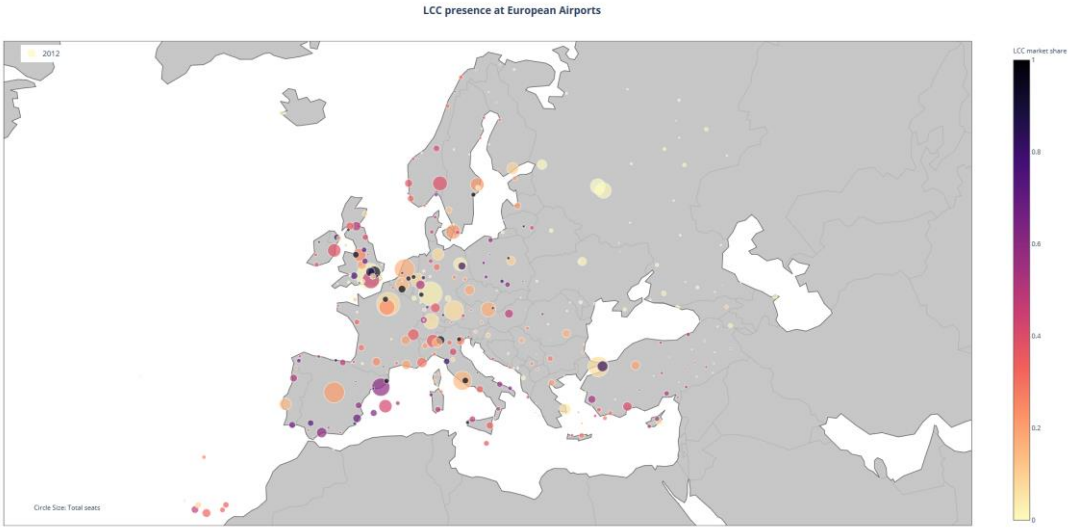

Figure 7. Evolution of LCC market at European airports, 2012. Source: Authors based on [1]

Indeed, by 2018 fewer airports remain with less than 10% LCC market share, such as London Heathrow, Frankfurt, Istanbul, Zurich, Sheremetyevo and Domodedovo in Moscow, Kiev Boryspil, along with "city" airports like London City, Milan Linate, Belfast City and Stockholm Bromma. Interestingly, as mentioned before, Greek airports are not dominated by LCCs either.

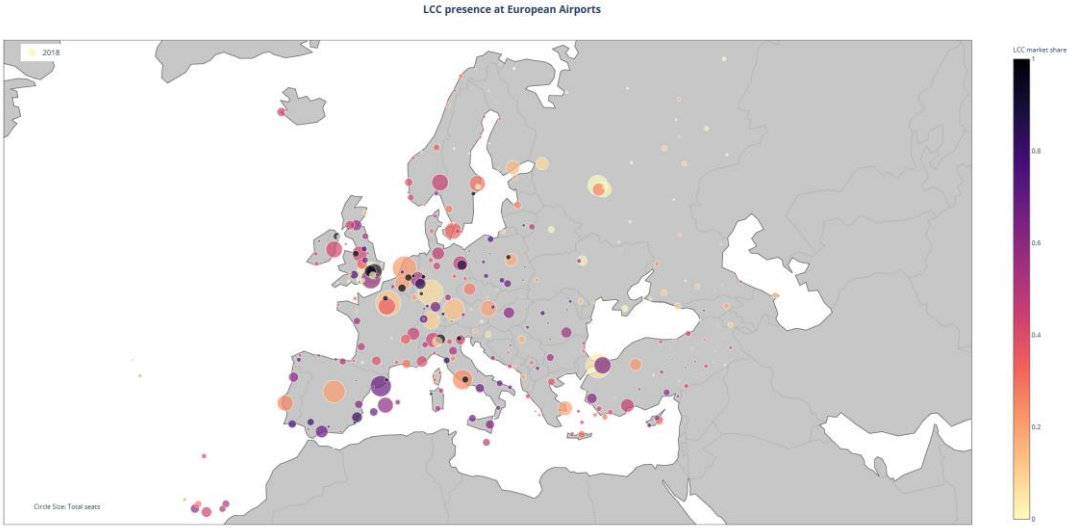

Figure 8. Evolution of LCC market at European airports, 2018. Source: Authors based on [1]

5. Conclusions

Results highlight the role that LCCs have played in boosting the growth of airports, both primary and secondary, that were keen to appreciate the development of the low-cost segment earlier. Indeed, despite the fact that LCCs have put many airports on the European map, during the second half of the period of analysis growth has been more significant for major airports. Hopefully this contributes to debunk the myth that LCCs *require* secondary airports. Instead, it should be considered how LCCs have transformed the entire airline and airport business to become mainstream. This is clear in the hybridisation of both legacy and original LCCs, sharing several operational and commercial practices, particularly in the intra-European market. For instance, as of 2019, no single major European carrier offers hold luggage or food included in the cheapest fare for intra-European flights, proving the acceptability of 'no-frills' and ancillary revenues with passengers of all carrier types. Similarly, operational practices such as disembarking using front and rear doors, even when using air bridges, have become increasingly common for legacy carriers.

As the differences between the business models of legacy and LCCs in Europe become increasingly blurred, the interesting question now is what would the next disruptive innovation in airline business be? LCCs transitioning to main airports have exacerbated the capacity crunch at major airports, whilst leaving available capacity at smaller regional airports that, arguably, could support the emergence of new business models.

Moreover, airports across Europe prove able to support different types of airline business models. This entails important insights for airports in other world regions where secondary or regional airports, with good infrastructure to support commercial air transport, are not as readily available as in Europe. Airports in South East Asia appear to be adapting to the impressive growth of LCCs, and long-haul low-cost, in the region. Airports in other regions where LCCs have started more recently, such as Latin America and Africa could be looking at these examples to harmonise the needs of LCCs within existent or planned infrastructure. Overall, managers of airports wishing to embrace the growth of LCCs require the adequate mindset to support strategic development that goes beyond specific infrastructure of a certain type or physical characteristics.

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